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Evaluating Participant Performance During Discrete Trial Training with Various Sources of Materials

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by

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Abstract

Previous research has shown that board certified behavior analysts have participated in gift giving exchanges with their clients. There is minimal guidance from the Behavior Analyst Certification Board in what constitutes a gift and how gift giving might influence client behavior during discrete-trial training sessions. This proposal aims to provide a foothold into research on the use of stimuli provided by behavior change agents and parents in applied behavior analysis. Behavior change agents may include multiple members of a client behavior change team, such as therapists and parents. First, the study aims to evaluate if stimuli provided by behavior change agents, or parents, influence discrete trial teaching performance when compared to standard stimuli typically used during sessions. The second dependent variable will be the duration of client engagement with stimuli from each source. Third, the present study will explore the duration of problem behavior(s) during DTT sessions. The fourth dependent variable will be clients' staff preferences. Lastly, the present study also explores the extent to which researcher or parent-provided stimuli may impact duration and content of parent interactions with therapists.

Keywords: Discrete Trial Teaching; Novel Stimuli

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Chapter I: Introduction and Literature Review

According to the Behavior Analyst Certification Board (BACB) *Professional Ethical and Compliance Code* (hereafter referred to as the BACB code), board certified behavior analysts (BCBAs) are prohibited from giving or receiving gifts from clients to mitigate the possibility of developing a multiple relationship (BACB, 2014). The BACB offers no clear direction as to what qualifies as a gift. Presumably, gifts would include items of obvious monetary value like cash, gift cards, electronic devices, or large toys (Bailey & Burch, 2016). However, the inclusion of gifts that have low monetary value is subject to debate (Witts et al., 2020). Further consideration should also be given to items brought into session by therapists and parents, whether this is to replace old or broken stimuli, or make therapy easier by using more appropriate items, such as parents purchasing a unique pair of shoes that are easier to tie, or therapists bringing additional items that may function as reinforcers.

Gift Giving in Related Fields

Other clinically-driven practices including psychology, psychiatry, and medicine in Western culture may provide guidance to operationally define a gift given during services. However, similar or nonexistent definitions of what comprises a gift in clinical practice are commonplace. For instance, the American Psychological Association (APA) code of ethics (APA, 2017) lists similar criteria to the BACB regarding multiple relationships and conflicts of interest. Similar to the BACB code, the APA code also outlines a multiple relationship can exist when a professional engages in more than one role (e.g., friend) with a client (Lord Nelson, Summers, & Turnbull, A. P. (2004). The APA code highlights a psychologist must take reasonable steps to resolve the issue with respect to both the individual and the APA code.

Despite these similarities with the BACB code of ethics, the APA code makes no mention of gifts in practice, or how presenting gifts may or may not constitute a multiple relationship.

Relatedly, the American Psychiatric Association medical ethics code (American Psychiatric Association, 2013) advocates for client rights and avoiding exploitative relationships. The code provides no information on accepting or giving gifts to clients during practice. Contrastingly, the American Medical Association (AMA) code of ethics (American Medical Association, n.d.) does have a specific stipulation regarding *accepting* gifts from clients. The AMA code defers to the judgement and expertise of the medical practitioner in choosing to accept or refuse gifts. The AMA's ethical codes suggest that in appropriate contexts, accepting gifts from clients may *strengthen* the practitioner-client relationship. Other professionals in psychology (Zur, 2012) have cited cultural practices and traditions as a justification of the exchange of gifts, as the refusal of such may potentially cause more harm than good (Rosenberg & Schwartz, 2018). Keeping in mind that these clinical practices, as well as behavior analysis serve a diverse multitude of clients, the acknowledgement of cultural rites and traditions which may include the exchange of gifts, is an essential part of providing the highest quality of services possible.

Culture and Gifts

In the midst of an ongoing cultural population shift (Humes, Jones, & Ramirez, 2011; U.S. Census Bureau, 2013) in the United States, Fong, Ficklin, and Lee (2017) echoed the frequent calls for diverse programs, staff, and mentoring opportunities to create more culturally competent behavior-analytic training for practitioners and behavior-change programming for clients. One such cultural practice is the presentation, acceptance, or otherwise exchange of gifts

among familiar individuals. Sue and Zane (2009) postulated gift giving, particularly among Asian-Americans, is an essential part of the early stages of psychological therapy. If professionals provide gifts early in therapy, this may associate the relationship between work in therapy with positive experiences. The authors state evidence-based therapy requires ongoing treatment that may have limited, immediate observable effects. Thus, the tangible exchange of a gift to a client allows for the professional to reinforce or acknowledge the client's contribution and attendance. In addition, Sue and Zane (2009) argued that the professional and client should gradually transition from tangible gifts to therapy-based "gifts" in the form of treatment. Finally, the authors claimed gift gifting may be an essential part of building rapport with clients, a process of great importance within behavior-analytic therapy (Shillingsburg et al., 2019; Taylor & Fisher, 2010).

The field of behavior analysis strives to use objective, empirical techniques for behavior change. These behavior-analytic technologies and tools should also be designed to address the needs of diverse clients and families. For example, applied behavior analysis is relatively new to Eastern societies, becoming widely recognized only in about the last 30 years in China (Clark & Zhou, 2005). A BCBA in the US may have a different opinion than BCBA from China on the necessity of gift giving during therapy. BCBAs in a Western culture may value establishing rapport with a client through social interactions, while those BCBAs in an Eastern culture may value gift exchanges when building client or family rapport. There is a need for BCBAs to account for these different cultural values when programming for behavior change (Brodhead, 2019). These different cultural values may be represented through the use of alternative treatment methods. Alternative treatment methods, those interventions or strategies unsupported

by behavior-analytic literature, may still have still have value when conceptualized through behavior-analytic framework.

Alternative Treatment Methods

To provide effective behavioral treatment, it is important BCBAs build and maintain professional relationships with their clients and families (Brodhead, 2015). During this collaboration, relevant stakeholders may suggest the use of an alternative treatment options. Xu et al. (2019) have shown detrimental client outcomes when BCBAs fail to collaborate with professionals who suggest nonbehavioral treatments (procedural drift, and a preference toward further nonbehavioral, nonempirical treatments). When considering alternative treatment methods, such as the use of novel stimuli during discrete trial teaching, Brodhead (2015) recommended determining if the alternative treatment would negatively impact client performance and if the procedure could be translated into behavioral principles. For example, an established alternative behavioral treatment method, gentle teaching (Jones & McCaughey, 1992), suffered from a lack of behavior-analytic investigations and used vague labels for existing behavioral processes. Despite these flaws, special education professionals accepted and used gentle teaching (McGee et al., 1987). It is possible gentle teaching contained elements of empirically sound behavioral interventions, such as use of antecedent manipulations (Smith & Iwata, 1997) and prompting social interactions. These behavioral processes may have contributed to either skill acquisition or behavioral reduction special educators and others reported seeing when using gentle teaching. One such alternative treatment approach which could benefit from further research is the use of gifts (therapist-provided, novel stimuli) and their influence on client's behavior during skill acquisition procedures.

Novel Stimuli as Gifts

When a therapist provides a gift to a client during behavior-analytic therapy, it may be conceptualized as the presentation of novel stimuli which may influence behavior during programming. Sarokoff et al. (2001) explored the use of stimuli with embedded text on teaching individuals with autism to engage in conversational exchanges about currently present stimuli. When assessing for generalization, novel foods and video games were presented to participants in the presence of novel peers while measuring the level of scripted and unscripted statements. Both participants' scripted statements generalized to novel stimuli and to a novel peer, demonstrating further mastery of unscripted statements via the use of novel stimuli. Therapists may encounter scenarios like this in practice, and may elect to bring novel, but functionally similar stimuli, to session, under the premise that these stimuli may serve to increase client attending behavior, promote similar or faster skill acquisition, or skill generalization. Stromer and Mackay (1992) investigated the impact of novel stimuli during a sequence production task in which a novel stimulus was presented in a sequence of familiar stimuli. Participants reliably selected the novel stimulus at the correct point in the sequence, suggesting novel stimuli may be a salient stimulus to evoke attending.

The use of novel stimuli may also allow for clinicians to provide more potential reinforcement options for clients to earn during programming. For example, Kenzer and Bishop (2011) presented a variety of novel stimuli in paired-stimulus preference assessments to 31 participants. In one condition, researchers compared the participants' preference to staff reported high-preference items to researcher-selected, novel stimuli. Only 25% of the participants selected the staff reported high preference items, with most participants selecting the novel stimuli. This

study demonstrates that the use of stimuli unavailable in the client's environment may increase the client's available options to use as putative reinforcers. It remains unclear how these novel stimuli, or potential gifts, might impact a client's performance during skill acquisition, since the use of multiple stimuli which thereafter may become discriminative stimuli, would make any change of behavior more difficult to attribute.

Novel stimuli may also facilitate natural learning opportunities, such as the ability to tell socially appropriate lies (Bergstrom et al, 2016) or seek out information (Taylor & Harris, 1995). Bergstrom et al (2016) evaluated a training package to teach participants with autism to tell socially appropriate lies when receiving an undesired gift. Researchers used novel stimuli (items with low monetary value such as stickers and puzzles) in their gift-giving intervention. Following the training package, participants reliably told socially appropriate lies when receiving novel, undesired gifts across different gift givers. Taylor and Harris (1995) used a time delay procedure to teach children to ask the question "What's that?" when presented with novel stimuli. Participants were able to ask the question in the taught context, as well as within novel settings with novel stimuli. The outcomes of these studies illustrate the practical implication of using novel stimuli as tools to provide learning opportunities for individuals with disabilities, which might otherwise be unavailable, and therefore require greater care to define.

Defining Gift Giving

One way to begin to define a gift giving in behavior analysis might be through anthropological consensus, or the most universally applicable definition for a gift, which takes cultural factors like traditions, rituals, region, and age into account. For example, Graycar and Jancsics (2016) addressed gift giving and corruption in public administration, attempting to

differentiate the legal opportunity to give gifts, from the illegal act of giving bribes. They postulate, as evidenced by anthropological studies (Torsello & Vernard 2015; Werner, 2002), gift giving and bribing should be defined by the population it encompasses, not the outside observer. Gift giving is an emic concept that varies by culture, region, and age. Ambwani (2014) and others (Cheal, 1996; Larsen & Watson, 2001; Macklin & Walker, 2015) have proposed gift giving be examined in a cross-cultural context. Thus, when conducting research on gift giving in Western populations within North America, Ambwani (2014) defined gift gifting as:

> The act where a tangible or intangible object given as a gift attains value through the functional utility inherent in the object along with the symbolism embedded in the manifestation of the giver's feelings about the recipient, the occasion and/or the relationship between the giver and the receiver. (p. 32-33)

Using this definition to highlight the functional utility of novel stimuli, the following definition is proposed to define gifts that will be used in this study: Novel stimuli which are noncontingently presented to participants by either their parent(s) or therapists, which can be used for participant behavioral targets and will be retained by participants following the initial presentation. It is possible that the use of such stimuli from alternative sources may result in a change in staff preference, for which the current study's data collection was informed by previous literature (Smith et al, 2005) which examined the preferences of profoundly mental retardation.

Present Study

The BACB code charges BCBAs to provide the highest quality services possible toward clients, a goal which could aided through bringing in alternative stimuli in sessions. By providing

these stimuli to clients, BCBAs may improve client performance in DTT. The present study has is a preliminary examination in how to explore the use of stimuli from different sources of change agents. First, the researcher aims to determine the extent to which the presentation of stimuli (researcher-provided or parent-provided stimuli) vs. standard stimuli (stimuli in the participant's home) influence participants' correct responses during DTT sessions.

Participant engagement with all three sets of instructional stimuli were measured and compared, in addition to participant problem behavior duration during DTT sessions incorporating novel and standard stimuli. It was explored to what extent the use of researcher and parent-provided stimuli resulted in a change in participants' staff preferences, as a potential indicator of the formation of a multiple relationship between participants, participant parents, and preferred staff who present novel stimuli to participants.

By using different sources of stimuli during DTT sessions, it is also possible a multiple relationship with the parents may develop. An additional way a multiple relationship may emerge is when the behavior-change agent and parents engage in conversation discussing nontherapeutic topics (e.g., personal relationships). Thus, the final purpose of the study was to evaluate the extent to which parent conversations change as result of using different stimuli during DTT sessions.

Chapter II: Method

Participants

The researcher recruited three participants (hereafter referred to as P1, P2, and P3) who received behavior-analytic services from an ABA agency that serves diagnosed with autism spectrum disorder on the West Coast of the United States. Participants had DTT programs as part of their behavioral programming. The researcher embedded the present study's procedure within their scheduled ABA appointments to target skill deficits.

P1 was a 21-year-old male, who had been receiving services from the ABA agency for 13 years. P1 had skill deficits in fine motor tasks. Historically, his behavior-analytic programming targeted fine motor skills associated with daily living tasks (folding and hanging clothing, toothbrushing, applying deodorant, and brushing hair). For the current study, the research team targeted a fine motor daily living skill, buttoning. P2 was a 17-year-old male, who had been receiving ABA services from this agency for 6 years. P2 had skill deficits in responding to social cues and using descriptive verbal behavior (e.g., using adjectives). During the course of this study, the research team provided instruction on vocally labeling physical features of objects (i.e., tacting). P3 was a 9-year-old male, who had been receiving services from the agency for 1 year. P3 had skill deficits in vocally recalling actions that he had performed. For this study, the research team provided instruction on vocally recalling events, (e.g., recalling what toys with which he recently interacted).

Materials

For each participant, the research team used three sets of instructional stimuli during DTT: standard stimuli, parent-provided stimuli, and researcher-provided stimuli. Standard

stimuli were instructional materials present in the participant's therapy setting. Parent- or researcher-provided stimuli were stimuli given to the participant during research sessions that were not present in the setting (see Appendix B for stimuli and cost). For P1, the standard stimulus was a buttoning board, parent-provided stimulus was a flannel shirt, and the researcher-provided stimulus was a button snake. For P2, the standard stimuli was a bag of textured rocks found in their home, the parent-provided stimuli was a bag of differently textured objects (gel and tape), and the researcher-provided stimuli was a bag with two differently textured sponges. For P3, standard stimuli was a bag of small toys present in the participant's home, parent-provided stimuli was a bag of three different small toys, and the researche-provided stimuli was a bag of three different small toys.

Setting

The research team conducted sessions for P1 over Zoom, while the participant was in a designated area of his home, approximately 4.0 by 4.0 m room with a table, three chairs, and various toys and books. For P2 and P3 sessions, the participants were in designated areas of their homes. For P2 this was a 3.0 m by 3.0 m outside area with a table and four chairs. For P3 this was a 5.0 by 7.0 m bedroom with a table, three chairs, and various books and toys.

Dependent Variables

There were total of five dependent variables for this study (see Appendix C for data sheets): (a) correct DTT responses, (b) stimuli engagement duration during free operant periods, (c) problem behavior duration during sessions, (d) participants' staff preferences, and (e) therapist-parent interaction. The research team collected the primary dependent variable, correct

DTT responses, during each research session. Given resource constraints, the research team collected the remaining four dependent variables on a rotating basis.

For P1, independent, correct DTT responses were beginning to engage in the buttoning action within three seconds of presentation, completing the action within ten seconds, and using the applicable materials (button board, button snake, and buttoned shirt) to complete each response. For P2, correct DTT responses were defined as vocally labeling an object with the corresponding attribute within three seconds of being asked, such as labelling a sponge as "squishy." For P3, correct DTT responses were defined as vocally expressing the play action which the participant performed 30 seconds prior when asked, within five seconds (e.g., "I played with the car"). For each participant, the research team converted independent, correct DTT responses into a percentage by dividing the total number of correct, independent responses by the total number of opportunities, and multiplying it by 100.

The second dependent variable was participants' staff preferences. Staff preference was determined via a multiple stimulus without replacement (MSWO) preference assessment (see procedure below). Each session in which staff MSWO preference occurred, a ranking was determined. For example, if staff A was selected first, the assigned ranging would be "1." Lower numbers correspond to a higher preferred staff (i.e., staff selected first).

The third dependent variable was the problem behavior duration (minutes) during DTT sessions. Problem behaviors were behaviors listed on the participant's behavior intervention plan (see Table 4 for definitions).

The fourth dependent variable was stimuli engagement, tracked in minutes during break periods. Stimuli engagement was any instance in which the participant manipulating the stimuli in their hands for at least three seconds during breaks.

The research team also collected duration (in minutes) and content on parent interactions pre and post DTT sessions as the fifth dependent variable. Parent interactions were any vocalizations exchanged between the research team and the parent pre and post DTT sessions which lasted at least 30 seconds. Pre DTT sessions began when the researcher entered the session area, and ended when the researcher presented the first trial to the participant. Post DTT session began when the researcher completes the last trial with the participant and ended when the researcher exited the therapy area. The research team recorded the duration in minutes of the parent interaction and the topics discussed and summed the durations pre and post DTT session.

Research Assistant and Data Collector Training

The lead researcher trained agency staff (research assistants) to assist with conducting research sessions collecting participant and parent data using behavioral skills training (BST; Parsons & Rollyson, 2012). The lead researcher provided a vocal review of the three stimuli conditions, using a prewritten script detailing the intervention package (see Appendices C and D). Following the review, the researcher answered questions and modeled the procedures. Research assistants then practiced the intervention during a simulated practice opportunity. When research assistants engaged in 80% (no more than one error) correct implementation and data collection of each condition three consecutive times, they met the criteria to assist with the study. Training scores ranged between 80% to 100% across research assistants, with a mean

score of 91%. All research assistants met mastery criteria for correct implementation and data collection during simulated practice opportunities.

In addition, the researcher also trained each participant's BCBA and one participant's parent to collect reliability data. The researcher reviewed the data collection procedures with the parents and BCBAs. The parent and BCBA practiced data collection with the researcher simulating the participant during practice opportunities. When parents and the BCBA achieved a reliability score of 80% or higher with the researcher across three consecutive practice opportunities, they were included as reliability data collectors for the study. Parent and BCBA training scores ranged between 80% to 100%, with a mean score of 93%. All parent and BCBA research assistants met mastery criteria for correct data collection.

Interobserver Agreement

Researchers and trained research assistants independently scored dependent variables during DTT sessions to conduct interobserver agreement (IOA). For a complete collection of IOA scores and percentages across dependent variables and participants (see Tables 1-3). When collecting IOA for DTT sessions, the research team assessed IOA using the trial-by-trial method (Cooper et al., 2007). The research team summed the number of trials in which there are agreements, divided by the number of trials within the session, and multiplied the proportion by 100 to obtain an agreement score for the session.

Caregivers assisted with reliability data collection for stimuli engagement and problem behavior duration were not able to unable to devote their full attention for the entire research session. For this reason, caregivers independently tracked the occurrence of the corresponding behaviors for 5-min intervals, using partial-interval recording *while* researchers took continuous

duration data on stimuli engagement and problem behaviors. Researchers summed the number of agreements between intervals for problem behaviors or engagement with stimuli occurrence, divided by the total number of intervals, and multiplied the proportion 100 to obtain an agreement score for these sessions.

When collecting IOA for staff preference assessments, researchers independently scored the preference hierarchy selection. The research team summed the number of agreements in preference selection dividing by the total number of preference selections, and multiplying the proportion 100 to obtain an agreement score for the session.

IOA for parent interaction data only included the research team and one other trained professional, since the parents were unable to collect data on this measure. Since parent interactions were of variable length, point-to-point correspondence was used as the IOA measure. A researcher and team BCBA recorded the length in minutes for each interaction, and the topic(s) discussed, and compared for point-to-point correspondence.

Treatment Integrity

The research team collected data on the accuracy with which the researchers implemented DTT, under their assigned stimuli condition, and participant staff preference assessments at least once following training to ensure protocol retention. Treatment integrity components included accuracy with which the research assistants (1) ran the program in the correct setting with necessary stimuli present, (2) delivered the correct verbal and nonverbal stimuli, (3) provided preferred items for independent, correct responses, (4) implemented error correction procedures, and (5) followed the participant's behavior intervention plan, if applicable.

The research team calculated treatment integrity scores by dividing the correct number of treatment integrity components out of the total number of treatment integrity components and multiplying the proportion by 100 to obtain a percentage. Each research assistant in each stimuli condition achieved an treatment integrity score of 80% or above at least once during the course of the study, with no assistants requiring further re-training.

For P1, DTT and preference assessment treatment integrity was assessed for 15% of sessions. DTT implementation had a mean score of 90% and a range of 80% to 100%. Staff preference assessment implementation had a mean score of 83%, and a range of 60% to 100%. For P2, DTT and preference assessment treatment integrity was assessed for 9% of sessions. DTT implementation had a mean score of 100% and a range of 100% to 100%. Staff preference assessment implementation had a mean score of 83%, and a range of 60% to 100%. For P3, DTT and preference assessment treatment integrity was assessed for 10% of sessions. DTT implementation had a mean score of 90% and a range of 80% to 100%. Staff preference assessment implementation had a mean score of 100%.

Experimental Design

To investigate the extent to which stimuli from different sources may influence participant correct responding during DTT programs, the researcher used an adapted, alternating treatment design. This adapted alternating treatment design functions by switching between three different stimulus conditions–standard, parent, and researcher-provider stimuli–to determine which source of materials, if any, facilitated behavior change (Barlow, & Hayes, 1979; Sindelar et al., 1985) across three skills in the same functional response class.

Due to the clinical needs of the participants and the study's goal, the research team did not conduct formal baseline sessions. Prior to this study, the researcher and BCBA had conducted skill assessments during biweekly clinical meetings for each DTT target used. The skill assessments showed that these are deficits the participants' repertoires. Due to clients' needs to maintain and report progress on currently written goals which included the current DTT targets, further skill assessment could not be conducted. Second, stimuli from other sources cannot be used in a both baseline *and* the alternating treatment phases due to the novel nature of the items, which would be lost from baseline to treatment. The inclusion of another set of stimuli specifically for baseline sessions might make conclusions regarding the impact of stimuli from other sources on participant behavior unclear.

Procedure

Sessions were held for 2 months during scheduled appointments with research assistants. Sessions began with the researcher or assistant entering the research area. If applicable, researchers recorded parent communication length and topics upon entering the therapy area. Upon greeting the participant, researchers used either the preliminary or subsequent rotating phrases for accessing parent-provided or researcher-provided stimuli, or gathering stimuli for the standard stimuli condition. Item or edible preference assessments were then conducted to determine the putative reinforcer options to use during sessions. If applicable, staff preference assessments were conducted. DTT trial sessions were run using standard, parent-provided, or researcher-provided stimuli. Following the end of the research session, before the end of the therapy appointment, participant engagement with program stimuli was also recorded during breaks. These periods were usually no more than five minutes, during which time preferred

stimuli could be contacted. At the end of therapy appointments, researchers recorded parent communication length and topics if applicable and replaced the DTT stimuli among the participants' program stimuli before exiting the therapy area.

Preference Assessments for Putative Reinforcers for DTT Sessions

The researchers assessed participants' preferences for stimuli that might function as putative reinforcers during DTT sessions. The research team asked the participant's BCBAs, parents, and participants for items or edibles that may have been preferred. Using this information, the research team conducted a brief MSWO preference assessment (Daly et al., 2009) to establish a hierarchy of preferred stimuli to use as putative reinforcers.

Staff Preference Assessments

Prior to the staff preference assessments, the researcher exposed participants to pictures of each research assistants on the participant team and asked participants to vocally label the staff presented on the picture. Following the exposure trials, the researcher assessed participant's staff preferences. The researcher had participant's parents or caregivers present the participant with an array of three staff pictures and stated "Pick your favorite staff."

Following the selection response, the parent or caregiver rotated the array, presented the vocal directive "Pick your favorite staff" until all options were selected following the above procedures. In the event, the participant selected more than one picture, the parent or caregiver represented the array with an additional 0.3 m between staff pictures and blocked additional responses once a selection occurred. If the participant did not select, the parent or caregiver used two-step prompting (restating the vocal directive with a gesture, then partial physical prompt) toward the array (not toward any specific picture) until a selection occurred.

Parent Interactions

Throughout the study, the researcher and research assistants collected parent conversational data during each session by using a stopwatch to track conversation duration and noted the topics discussed. At the onset of each session, the researcher team offered typical greetings to parents (e.g., “Hi ___, how is [participant] doing?”) and avoided initiating personal topics. In the event the parents engage in personal topics (e.g., “Any weekend plans?”), the research team responded by making one statement or question in response related to the parent’s statement or question (e.g., “I’m going out to dinner tonight.”). If a parent were to discuss other clients or other information which may constitute a privacy violation, the research team gently reminded parents of the confidential nature of ABA treatment. At the end of each session, the research team offered typical farewells to parents (e.g., “See you next time”) without initiating any additional conversation. The research team responded to parent inquires or statements by making one statement or question related to the parent inquiry.

Standard Stimuli vs. Parent Stimuli vs. Researcher Stimuli DTT Sessions

For standard stimuli DTT sessions, the research team used materials in the participant possession. The lead researcher and research assistants implemented the DTT procedures described below. The research team did not orient the participants to the standard stimuli, outside of what is necessary (e.g., “Please get the buttoning board.”). Mastery criteria for each DTT target was 3 consecutive sessions at 80% or higher correct. Each researcher was assigned to a specific stimuli condition, and always ran the same stimuli condition when conducting the current DTT targets. Normally scheduled therapy appointments allowed for stimuli conditions to be frequently alternated between researchers.

For researcher-provided stimuli DTT sessions, the lead researcher purchased items that were used as stimuli during DTT sessions. The agency did not purchase any stimuli, nor did these stimuli include materials which the participants already possessed. The research team implemented the DTT procedures described below. At the onset of the first session using researcher-provided stimuli, the research team member presented the item to the participant and stated "I have this cool new [stimuli name] I brought for us to use during session, and you can keep it when we're done!" Since the novel stimuli belonged to each participant and remain in the participant's home, the research team used different phrases during subsequent DTT sessions when researcher-provided stimuli (see Appendix F for additional phrases).

For the parent-provided stimuli condition, the lead researcher purchased items that were used during DTT sessions but gave the stimuli to parents to present to the participants during the first session under this stimuli condition. At the onset of the first parent-provided stimuli session, parents presented stimuli to the participant and use the similar phrases used for the researcher-provided stimuli condition. During subsequent parent-provided stimuli sessions, a rotating list of phrases were used were used.

P1 DTT Program. Each session the researcher provided the relevant verbal stimulus while simultaneously presenting the relevant nonverbal stimulus, which include a buttoning board (standard stimulus), buttoned shirt (parent-provided stimulus), or a button snake (researcher-provided stimulus). If P1 correctly responded, the researcher delivered the selected preferred item (as determined by the MSWO) on fixed-ratio 1 (FR 1) schedule and behavior-specific praise. If P1 did not respond within three seconds, the researcher used least-to-most prompting (gesture and partial physical prompts) to guide the response with three seconds

between each prompt. If P1 engaged in an incorrect response, the researcher provided a full-physical prompt. If P1 required physical prompts, the researchers did not provide the preferred item. Following the incorrect response, the researcher represented the trial to allow for P1 to engage in an independent, correct response up to three times. If P1 engaged in a correct, independent response during the error correction procedure, the researcher provided the preferred reinforcer and behavior-specific praise.

P2 DTT Program. The researcher presented the relevant nonverbal stimulus, which included textured rocks (standard stimuli), tape and hair gel (parent-provided stimuli), or two differently textured sponges (researcher-provided stimuli). If P2 correctly responded, the researcher delivered the preferred reinforcer as determined by the MSWO preference assessment on a FR 1 schedule, and behavior-specific praise. If P2 did not respond within three seconds or responded incorrectly, the researcher used least-to-most prompting (partial-vocal echoic and full-vocal echoic prompts) to assist the participant with the required vocal response with three seconds between each prompt. If P2 required full-vocal, echoic prompts, the researchers did not provide the preferred item. Following the incorrect response, the researcher represented the trial to allow for P2 to engage in an independent, correct response up to three times. If P2 engaged in a correct, independent response during the error correction procedure, the researcher provided the preferred items and behavior-specific praise.

P3 DTT Program. The researcher stated the relevant verbal stimulus, “what did you do?” 30 seconds after the participant engaged in a play action with specific toys. For example, if targeting standard stimuli, the researcher would present toys around the participant’s room, such as a ball, and allowed the client to play with the toy for a short period. During the play period,

the researcher would use the participant's iPad to take a picture of the play action being performed, to be used as the first step of the correction procedure. Following the play period, the researcher would place the selected toy out of sight and wait 30 seconds before presenting the verbal stimulus, "what did you do?" If P3 correctly responded ("I played with the ball."), the researcher delivered the selected preferred item on FR 1 schedule and behavior-specific praise. If P3 incorrect responded incorrectly, or did not respond, the researcher implemented the participant's correction procedure which began with the visual prompt of the action as captured on the iPad paired with the verbal stimulus, then a partial echoic, then a full echoic prompt. Following the incorrect response, the researcher represented the trial to allow for P2 to engage in an independent, correct response up to three times.

Chapter III: Results

DTT Performance

Figure 1 displays three participant's independent performance across DTT sessions using standard (black circles), parent (white circles), and researcher-provided (grey circles) stimuli. P1's DTT performance (top panel) during the standard-stimuli condition showed an increasing trend, followed by mastery after eight sessions. Initially, during the parent-provided stimuli, P1 DTT performance was at lower levels; he achieved mastery after seven sessions. Finally, during the researcher-provided stimuli condition, P1 DTT correct responses were at 100% following the initial exposure. P1 mastered buttoning during the research-provided stimuli condition in three sessions.

P2 DTT performance (middle panel) during the standard stimuli condition was initially variable; however, mastery was achieved after nine sessions. P2 mastered the parent-provided stimuli condition in three sessions. During the researcher-provided stimuli condition, P2 performance was at initially at moderate levels, reaching mastery in five sessions.

P3's DTT performance (bottom panel) during the standard-stimuli condition demonstrated a variable trend mastery was achieved at eight sessions. During the parent-provided stimuli condition, P3's DTT performance was variable, and mastery was achieved in 17 sessions. During the research-provided stimuli condition, P3's DTT performance was variable and skill mastery with these materials was not achieved.

Stimuli Engagement Duration

Figure 2 depicts stimuli engagement duration during break periods. P1 engaged with the standard stimuli, on average, 0.3 minutes (range, 0–1.25 minutes). During parent-provided

stimuli conditions, P1 engaged, on average, with the stimuli 0.13 min (range, 0–0.66 min). Finally, in the researcher-provided stimuli, P1 engaged with the stimuli, on average, 0.12 min (range, 0–0.66 min). P2 engaged with the standard stimuli, on average, 0.27 minutes (range, 0 – 3.5 minutes). During parent-provided stimuli conditions, P2 engaged, on average, with the stimuli 0.1 min (range, 0 – 0.5 min). Finally, in the researcher-provided stimuli, P2 engaged with the stimuli, on average, 0.14 min (range, 0 – 1 min). P3 engaged with the standard stimuli, on average, 9.14 minutes, (range, 2 – 30 minutes). During parent-provided stimuli conditions, P3 engaged, on average, with the stimuli 3.5 min (range, 0 – 10 min). Finally, in the researcher-provided stimuli, P3 engaged with the stimuli, on average, 6.25 min (range, 4.5 – 7.25 min).

Problem Behavior Duration

Figure 3 shows participants' problem behavior duration during DTT sessions. P1 engaged in problem behaviors during the standard stimuli condition, on average, 0.1 minutes (range, 0 – 0.25 minutes. During parent-provided stimuli conditions, P1 engaged in problem behaviors, on average, 0.06 min (range 0 – 0.4 min). Finally, in the researcher-provided stimuli, P1 engaged, on average, 0.03 min (range, 0 – 0.4 min). P2 engaged in problem behaviors during the standard stimuli condition, on average, 0 minutes (range, 0 minutes). During parent-provided stimuli conditions, P2 engaged in problem behaviors, on average, 0.05 min (range, 0 – 0.5 min). Finally, in the researcher-provided stimuli, P2 engaged, on average, 0.16 min (range, 0 – 0.66 min). P3 engaged in problem behaviors during the standard stimuli condition, on average, 0.04 minutes (range, 0 – 0.33 minutes. During parent-provided stimuli conditions, P3 engaged in problem behaviors, on average, 0.14 min (range, 0 – 0.4 min). Finally, in the researcher-provided stimuli, P3 engaged, on average, 0.59 min (range, 0 – 1.75 min).

Participant Staff Preference

Figure 4 displays participants' staff preference assessment results. The y-axis indicates the trials to participant selection, with lower numbers indicating a higher preference. For P1, the staff member associated with the standard stimuli condition was consistently selected first for 15 of the 22 assessments, with the staff member associated parent-provided stimuli selected first for three and four of the assessments for parent-provided and researcher-provided stimuli, respectively.

For P2, the staff member associated with the standard stimuli condition was consistently selected first for two of the 15 assessments, with the staff member associated parent-provided stimuli selected first for seven and six of the assessments for parent-provided and researcher-provided stimuli, respectively. When consecutive sessions with the same preference were found with P2 (consistently picking the standard-stimulus staff member third), the researcher identified incorrect MSWO implementation by caregiver. The researcher provided additional training and support regarding the caregiver's implementation of MSWO (indicated by the asterisk) and preferences shifted, and no longer were consistent.

For P3, the staff member associated with the standard stimuli condition was consistently selected first for eight of the 18 assessments, with the staff member associated parent-provided stimuli selected first for seven and three of the assessments for parent-provided and researcher-provided stimuli, respectively.

Parent Communication

Figure 5 displays the duration in minutes of conversation between researchers and parents during the beginning and end of appointments, while the accompanying Table 4 shows the topics

that were discussed, in order of most discussed topics to least discussed. The duration of parent communication at the beginning and end of therapy appointments did not show a consistent trend in any stimuli condition for any participant. Across participants and stimuli conditions, the most commonly discussed topics were session scheduling and programming; least discussed topics included weather or future plans.

Chapter IV: Discussion

For DTT, the results showed variable rates of acquisition among stimuli conditions, with no one condition showing faster acquisition, or consistently higher or lower scores than other stimuli conditions. All participants mastered a target skill under at least two of three stimuli conditions, although P3 did not reach mastery in the research-provided stimuli condition. In regard to mastery, one participant met mastery in fewer sessions in each of the conditions: standard-stimuli condition (P3), parent-provided stimuli-condition (P2), and researcher-provided stimuli condition (P1). In regard to participants' staff preferences, one participant (P1) demonstrated a preference for the staff member associated with the standard stimuli, and the other two participants did not show a clear preference for staff associated in any of the conditions. For participants' stimuli engagement, problem behavior duration, and parent interaction, there were not differentially high or low levels associated with the different sources of materials. When different average durations of problem behaviors occurred between stimuli conditions, these differences in duration were less than 30 seconds. Problem behaviors which occurred were typical to each participant, with no new or resurging problem behaviors under any stimuli condition. There were no notable changes in the engagement with stimuli, duration of problem behaviors, and parent interactions across participants and stimuli conditions. It may be surmised then, that the ability to bring items to session, which qualify as gifts, may make skill acquisition easier when agencies, parents, or other stakeholders are unable to provide stimuli, or additional stimuli for therapy. It is possible the inclusion of items which functions as gifts might not provide any added benefit or detriment to client skill acquisition, level of problem behaviors and item engagement, and interactions with parents. The ability to bring items as gifts to sessions

may also help facilitate certain learning opportunities, such as yes/no mands, additional tacting items, and others, which we see in both dated and recent literature.

These findings support existing literature in three ways. First, these findings support prior studies that show introducing alternative or novel stimuli can be effective in teaching and generalizing new skills (Bergstrom et al., 2016; Sarakoff, et al., 2001; Taylor & Harris, 1995) as shown in two of the participant's skill acquisition and mastery occurring faster in researcher-provided and parent-provided stimulus conditions (P1 and P2). Generalization of the skills taught in the current study might have also been possible through the use of multiple stimuli sets used for each participant. In addition, providing novel stimuli could have been preferred for participants and possibly functioned as reinforcers, supporting the participant's skill acquisition (Kenzer & Bishop, 2011).

Second, the results of the current study provided an initial demonstration to investigate ethical concerns in ABA, responding to calls to action cited by Witts et al. (2020), Fong et al. (2017), and Conners et al. (2019). Witts et al. (2020) demonstrated item exchanges (gifts) between clients and BCBAs occur in field of ABA. Although it remains unknown the nature of these gift interactions (parents giving therapists gifts, clients giving therapist's gifts, therapists giving client's gifts, etc.), presumably a therapist bringing items for a client to use during a teaching session could meet the definition of gift giving. The present study explored how to identify if this type of gift giving interaction impacted participants' performance.

Third, the outcomes of this current study suggest the use of stimuli from different sources might facilitate skill mastery at least as effectively as standard existing stimuli, without any change in clients' staff preferences, engagement with stimuli during therapy, problem behaviors,

or parent communication during skill acquisition sessions, all of which could contribute to an indication of a change in the client-therapist relationship. This is especially important when considering the nature of the client-therapist relationship, and that it encompasses both the participants, and the parents or caregivers. The current study, by measuring multiple dependent variables and conducting staff preference assessments, demonstrated the different sources of stimuli did not impact client preferences or parent interactions nor DTT correct responding.

There were a few limitations that warrant discussion. First, the level of functional control in the present experiment is weaker due to the lack of baseline data. Typically, adapted alternating treatment designs establish functional control of a response by comparing two or more instructional approaches using equivalent, but unique set of instructional items. Prior to alternating between the instructional stimuli conditions, baseline performance is typically taken on all instructional stimuli to ensure equivalent levels of performance. Notably, baseline performance was not collected for the present study, which sought to compare the rate of acquisition during DTT sessions when using novel stimuli from either parents or researchers compared to standard, agency-provided stimuli. Future researchers might achieve greater functional control by using the adapted, alternating treatment design by concurrently teaching the same response to two or more different participants. For example, if teaching two individuals to wash a window using three different sets of instructional stimuli (a rag, a squeegee, and a pressure washer) the researcher could gather baseline data on first participant's performance equivalence with all three items, while beginning immediately with the alternating treatments for second participant. If similar rates of acquisition occur for all three variations of the response

between participants, then the novelty of program stimuli might not have control over the rate of response acquisition.

Second, the extent to which the staff preference assessments were true indicators of participants' preference toward a staff member is limited. In the current study, participants were asked to select their favorite staff member; however, there was not contingent presentation of the selected staff (i.e., exposure to the staff member via video or in-person). As a result, the staff preference assessments conducted in this study might indicate the participant's preference toward the staff picture, not the staff member or their interactions. In addition, staff preference assessments might be best assessed with a neutral party. When a neutral person was unavailable to run the staff preference assessment for one participant in the present study, the participant was likely to select the person with whom they were currently working. Once this was found, all participants' parents were informed and were requested to pick a specific time during session during which they would be available to run the assessments, to decrease the possibility of participant selection bias. Future researchers should ensure staff preference assessments include contingent staff interaction following selection responses and neutral parties (other staff members who do not work with the participant) to conduct the assessments. Ensuring the accuracy of staff preference assessments selections is crucial in investigating if and when the occurrence of a multiple relationship occurs when using different sources of stimuli.

Third, the present study lacked the random assignment of alternating stimuli conditions. Due to scheduling constraints, random assignment of stimuli conditions could not be conducted. As a result, the outcomes of the study should be interpreted with caution given participants were exposed to conditions nonrandomly. As a result, mastery for a stimulus condition could have

occurred due to greater exposure to the stimuli. Future research should ensure randomization across different stimulus conditions and establish predetermined maximum number of sessions per condition to decrease the likelihood of one stimuli condition being mastered faster due to greater exposure.

Fourth, due to agency staff and client scheduling constraints treatment integrity could not be completed for 33% of sessions. To ensure that the available time was spent as efficiently as possible, additional scheduling management by the research team's company allowed for passing treatment integrity checks to be performed and achieved for every research assistant at least once. Future research should program for additional treatment integrity checks to mitigate the possibility of treatment integrity errors, as were found during the staff preference assessment.

Finally, there are considerations for future researchers. First, the researcher completed this study with participants in-person and over video conferencing. Future investigators might want to investigate the different sources of stimuli with participants from either one of these treatment modalities rather than both. Second, the participants in this study ranged in age and verbal behavior skill sets, limiting the use of verbal preference assessments for reinforcers and staff. It is possible outcomes shown in the current study might be different with clients with extensive vocal, verbal behavior. This type of gift exchange (different sources of stimuli used during session) might impact clients' behavior (skill acquisition, preference, or stimuli engagement) with higher skill sets differently. These clients might have the skill set to note the difference of standard materials versus items presented items as gifts. In addition, this participant profile might have the skill set in recognizing where the stimuli originating from (i.e., a staff

member), and establishing a preference for that particular stimuli condition, the therapist assigned to that stimulus, or both.

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Appendix A: Tables and Figures

Table 1

Interobserver Agreement Percentages for P1

Dependent Variable	Sessions with IOA recorded (%)	Mean IOA score (%)	IOA score range (%)
DTT Performance	37%	94%	80 – 100%
Engagement with Stimuli	30%	90%	60 – 100%
Duration of Problem Behavior(s)	30%	89%	70 – 100%
Staff Preference Assessment	25%	90%	75-100%
Parent Communication	8%	100%	100 – 100%

Table 2

Interobserver Agreement Percentages for P2

Dependent Variable	Sessions with IOA recorded (%)	Mean IOA score (%)	IOA score range (%)
DTT Performance	20%	96%	80 – 100%
Engagement with Stimuli	15%	88%	80 – 100%
Duration of Problem Behavior(s)	15%	90%	80 – 100%
Staff Preference Assessment	18%	96%	66-100%
Parent Communication	6%	100%	100 – 100%

Table 3

Interobserver Agreement Percentages for P3

Dependent Variable	Sessions with IOA recorded (%)	Mean IOA score (%)	IOA score range (%)
DTT Performance	33%	91%	80 – 100%
Engagement with Stimuli	33%	92%	70 – 100%
Duration of Problem Behavior(s)	33%	87%	70 – 100%
Staff Preference Assessment	30%	94%	66-100%
Parent Communication	11%	100%	100 – 100%

Table 4

Participant problem behaviors & operational definitions

Participant	Problem Behavior	Operational Definition
Participant 1	Hands on Head / Ears	Participant places one or more hand(s) on their ears or head with noticeable pressure (face may be shaking or turn red). May be accompanied by whining or vocal outbursts.
	Vocal Outbursts	Participant engages in noncommunicative outbursts which may be heard outside the current room or area.
	Eloping	Participant leaves the current area without permission or requesting to leave.
Participant 2	Repeated Statements	Participant repeats the same information more than once, may also be presented as a question.
	Ritualistic Behaviors	Participant engages in stereotypical cleaning, moving objects, removing objects. (E.g., participant may continually remove dead leaves from a plant.)
	Self-Stimulation	Participant engages in stimulation of their body (touching face, tapping foot, etc.)
Participant 3	Motor/Vocal Stereotypy	Participant engages in vocal or motor stereotypy while wearing their watch (during work or school times).
	Vocal Outbursts	Participant engages in noncommunicative outbursts which may be heard outside the current room or area.
	Licking	Participant licks part of their body (hands, lips, arms, etc.).

Table 5

Table depicting the parent conversation topics and topic frequency for each participant

Participant 1 Parent Conversations (Parent communication occurred for 40% of sessions)	
Topic Discussed	*Number of Times Discussed*
Scheduling	7
Covid-19	4
Participant schooling and programs	2
Weather	2
Weekend plans	1
Grocery shopping	1

Participant 2 Parent Conversations (Parent communication occurred for 30% of sessions)	
Topic Discussed	*Number of Times Discussed*
Scheduling	3
Programs	2
Weather	2

Participant 3 Parent Conversations (Parent communication occurred for 100% of sessions)	
Topic Discussed	*Number of Times Discussed*
Session summary	19
Scheduling	14
Previous session(s)	7
Participant homework and programs	3
Participant classwork	2
Problem behaviors	2
Weekend plans	2
Additional participant services	1

Figure 1

Percent Correct DTT responses across Stimuli Conditions across Three Participants

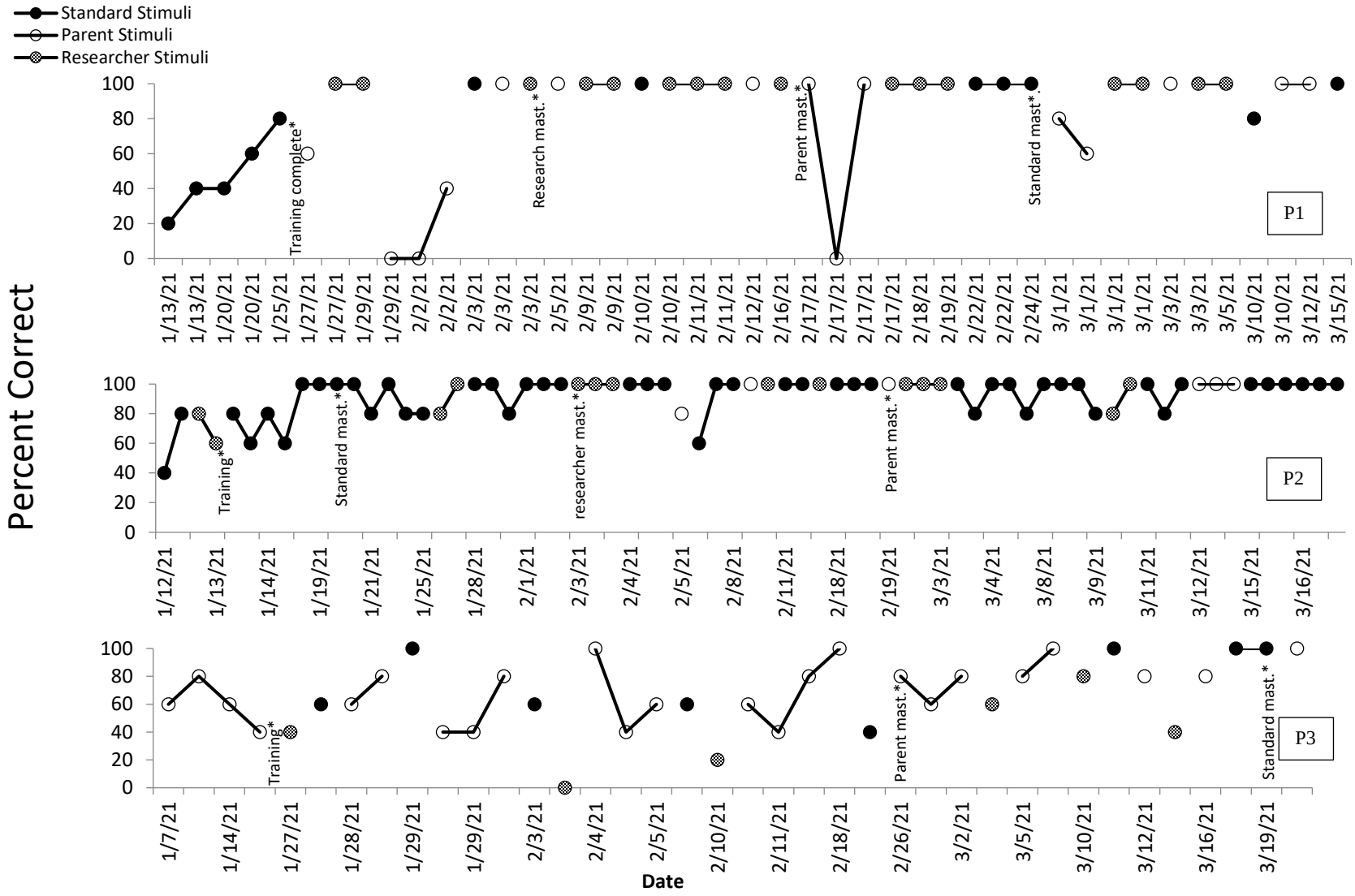


Figure 2

Duration of Engagement with Program Stimuli During Free Operant Periods across Three Participants

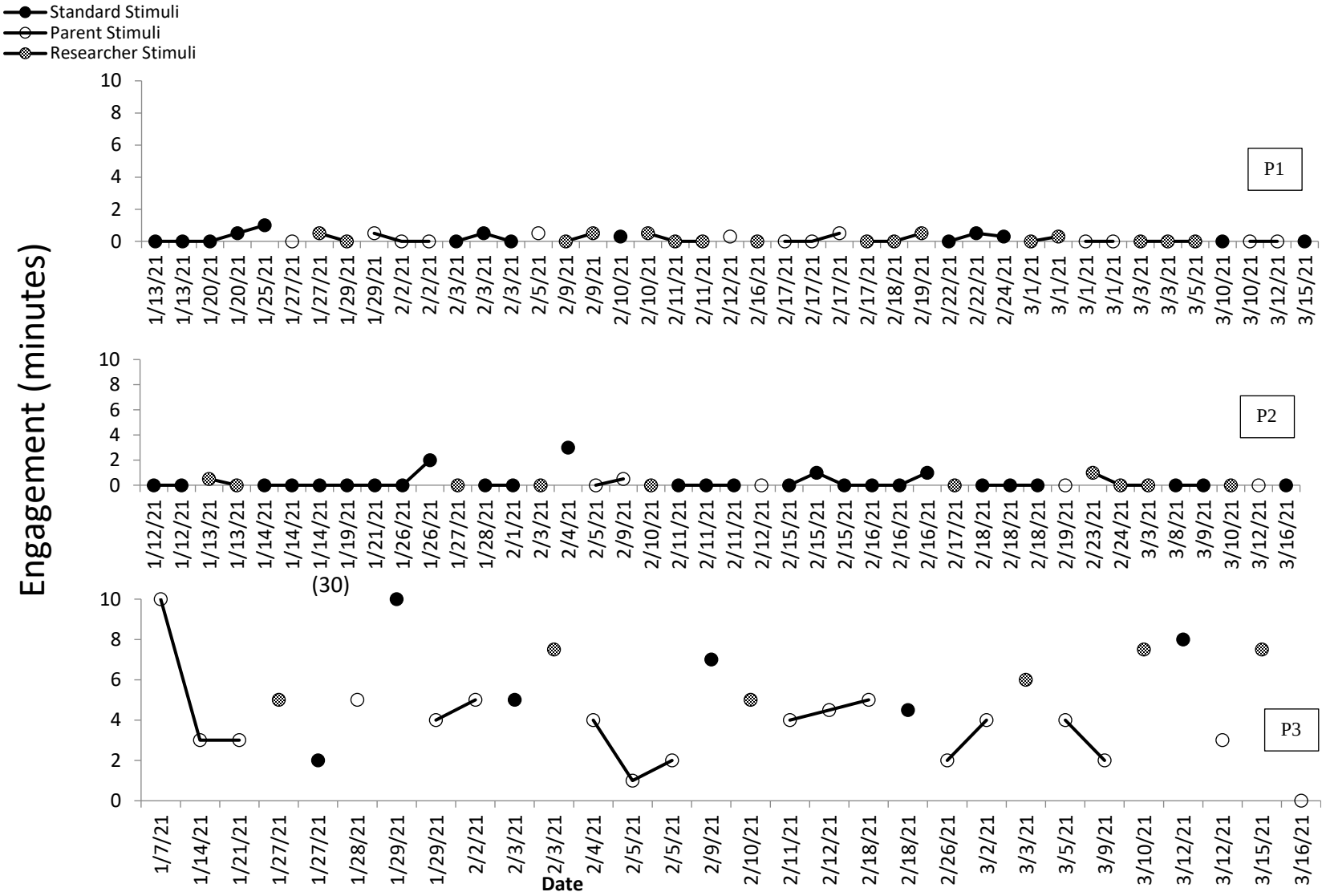


Figure 3

Duration of Problem Behaviors in Minutes During DTT Sessions for Each Participant across Stimuli Conditions

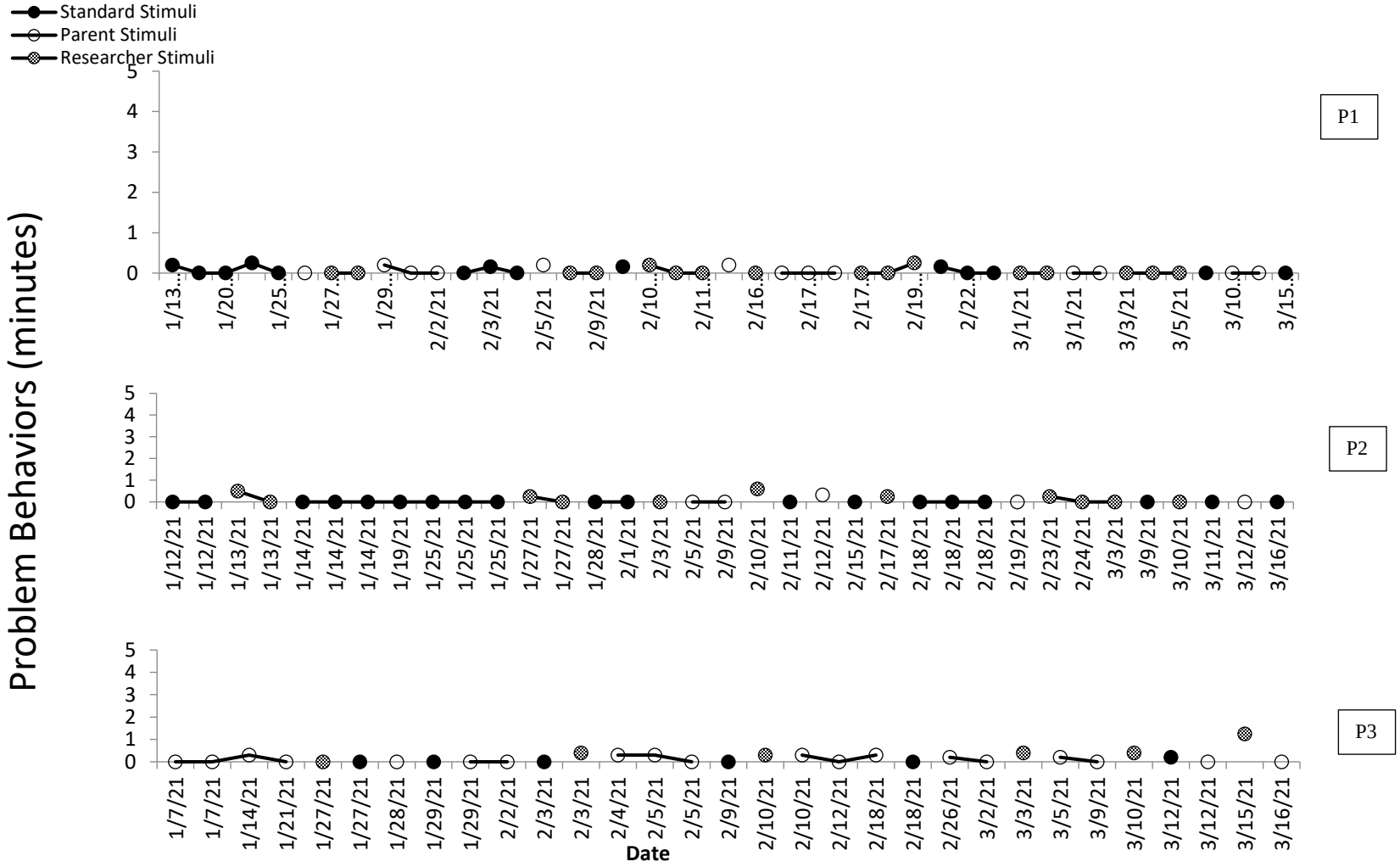


Figure 4

Participant's Preference of Staff across Stimuli Conditions

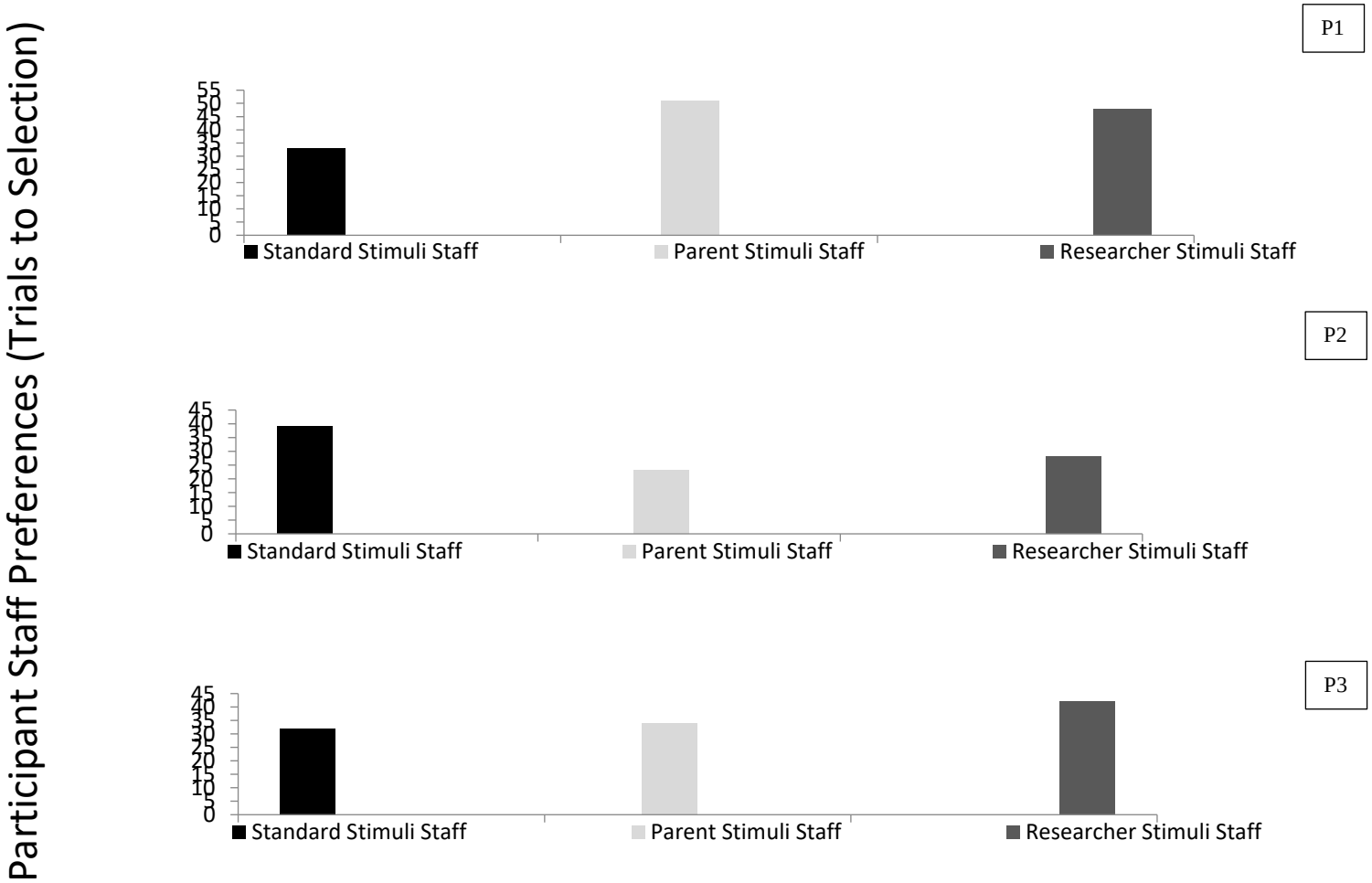
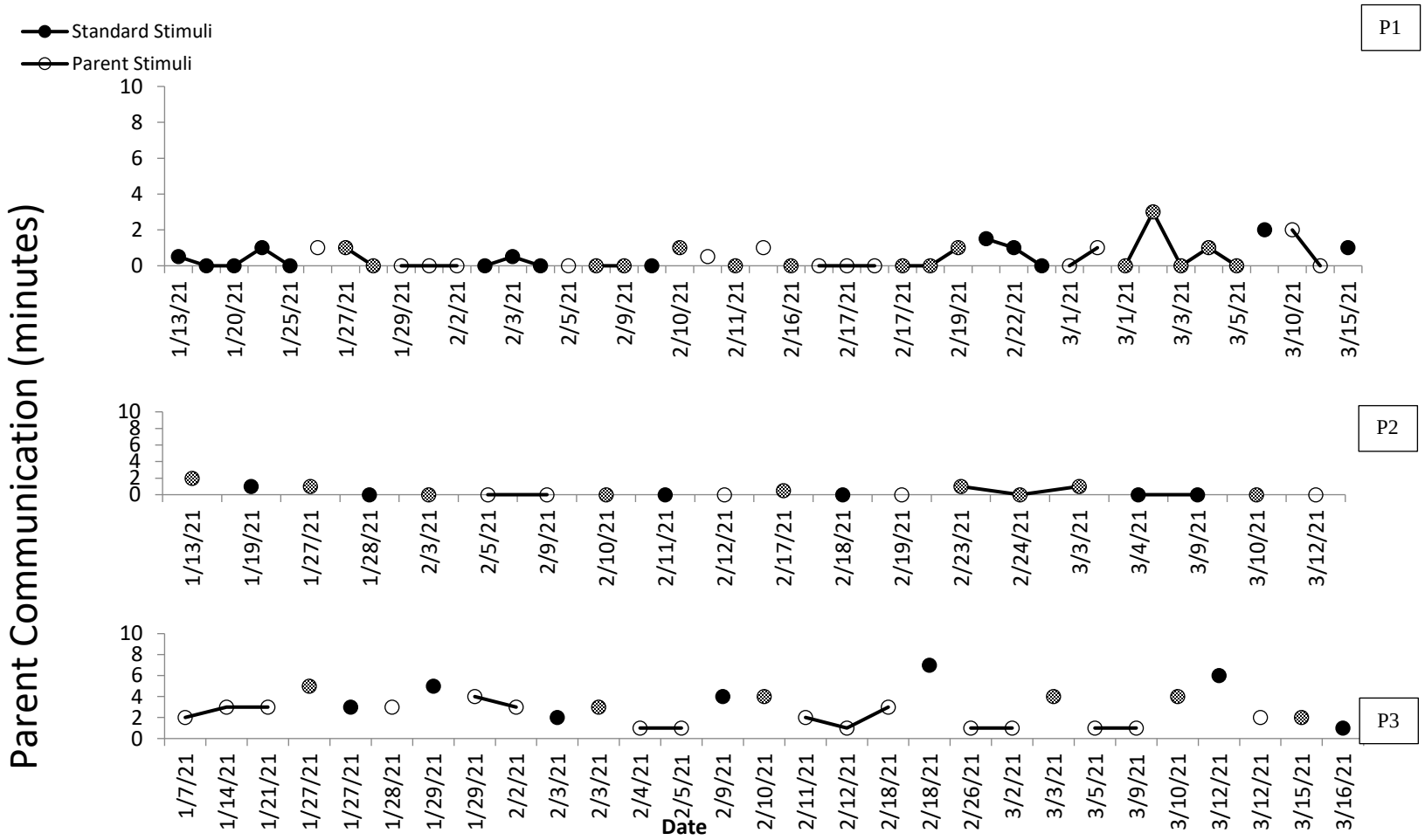


Figure 5

Length of Parent Communication in Minutes for Each Participant across Stimuli Conditions



Appendix B: Standard, Parent, & Researcher Stimuli

Participant	Standard Stimuli and Value	Parent-Provided Stimuli and Value	Researcher-Provided Stimuli and Value
P1	 A button board ($30.00, participant already owned)	 A used flannel shirt ($3.00)	 A button snake ($3.00)
P2	 Textured rocks (no purchase required)	 Textured sponges (approximately $0.80)	 Textured items: gel and tape (approximately $2.50)
P3	 Toys present in participant bedroom (no purchase req.)	 Three small toys (cars, slap bands, and water guns; approximately $0.40)	 Three small toys (party blowers, slinkies, tops) (approximately $0.40)

Appendix C: Data Sheets

Participant Data Sheet

Student:_____ Observer 1 (If IOA Taken): _____

Staff:_____ Observer 2:_____

Alternating treatment, materials provided by: **Researcher, Parent,** or **Standard** (circle one)

Behavioral Definition(s): Participant engages in correct DTT response within three seconds of presentation. Each DTT trial is one opportunity, schedule of reinforcement is FR-1 preferred as indicated by MSWO preference assessment at beginning of therapy appointment.

Date:_____ Calculating Interobserver Agreement

Start time:_____ _____(Total # of trial-by-trial agreements

End time:_____ between staff, and observers 1 and 2)

÷ ____ (Total number of opportunities)

Note: (+) = correct; (-) = incorrect =_____ (Percentage of agreement)

DTT Performance

Session 1	1)	2)	3)	4)	5)
Session 2	1)	2)	3)	4)	5)
Session 3	1)	2)	3)	4)	5)

Duration of problem behavior(s) during session(s) (minutes):

Duration of engagement with materials (if applicable) (minutes):

Parent Communication

Appointment *start* conversation length (minutes): Topic(s):

Appointment *end* conversation length (minutes): Topic(s):

Staff Picture Preference Assessment Data Sheet

Use corresponding # of trials based on how many staff are on the participant team. For example, if only three researchers are working with the participant, skip to trial #2 of each MSWO box.

Staff A: _____ Sum of trial #s for A: _____

Staff B: _____ Sum of trial #s for B: _____

Staff C: _____ Sum of trial #s for C: _____

Staff D: _____ Sum of trial #s for D: _____

Date:		
Participant Number:		
Researcher Name:		
Trial #	**Staff selected**	**Placement of staff selected**
1		x x x x
2		x x x
3		x x
4		x

Date:		
Participant Number:		
Researcher Name:		
Trial #	**Staff selected**	**Placement of staff selected**
1		x x x x
2		x x x
3		x x
4		x

Highest preferred staff (lowest summed trial #s):

Moderately preferred staff (moderate summed trial #s):

Lowest preferred staff (highest summed trial #s):

DTT Treatment Integrity Data Sheet

DTT targets should be run using the designated DTT data sheet. Correct implementation should include (1) correct setting and materials, (2) correct, timely presentation of materials, (3) the correct schedule of reinforcement with preferred stimuli as indicated by the MSWO preference assessment at the beginning of the therapy appointment, (4) correct implementation of the correction procedure, and (5) correct implementation of the behavior intervention plan.

For each component of the treatment integrity assessment, implementation should be marked as correct or incorrect. A score of 80% or higher (no more than one error) is required to achieve satisfactory treatment integrity.

(1) Correct setting and materials	(2) Presentation of materials	(3) Schedule of reinforcement	(4) Correction procedure	(5) Behavior intervention plan	**Percentage Score (Out of 5)**

Staff Preference Assessment Treatment Integrity Data Sheet

Staff preference assessments should be run using the designated MSWO staff preference assessment data sheet. Implementation of the staff preference assessment should include (1) Correct use of staff pictures and corresponding videos when selections are made, (2) neutral verbal statements during assessment, (3) removal of selected staff from subsequent trials, (4) randomization of remaining staff in array, and (5) creation of a hierarchy of staff preference.

For each component of the treatment integrity assessment, implementation should be marked as correct or incorrect. A score of 80% or higher (no more than one error) is required to achieve satisfactory treatment integrity.

(1) Use of pictures and videos	(2) Neutral verbal statements during assessment	(3) Removing selected staff picture from subsequent trials	(4) Randomization of remaining staff	(5) Hierarchy of staff preference	**Percentage Score (Out of 5)**

Appendix D: Stimuli Conditions

(Standard Stimuli)

During each session in which you are using standard stimuli, typical conditions will used, and you will run therapy as you normally would. When running the specific DTT program being used for the intervention, however, use the data sheet provided by the researcher as well as the one you would normally use.

(Researcher or Parent Stimuli)

During each session in which you are using stimuli from the researcher or parent, you will run most therapy programs as normal, but will use the alternative stimuli for a specifically designated DTT program, and run the specific stimuli program target. When running the specific DTT program being used for this research, however, use the data sheet provided by the researcher as well as the one you would normally use. The researcher or parent stimuli will be presented to the participant(s) by the researcher or parent at the first applicable session, so all research assistants will use a rotating list of phrases associated with the use of a specific stimulus in session, but with respect to the item being in the participant's possession.

Rotating Phrases for accessing Researcher/Parent stimuli (subsequent sessions)

"Let's get our new (item) to practice (DTT target)!"
"Guess what? Today we're going to use your new ___ while we're working!"
"Hey ___, remember the new ___ you got? Let's go get it so we can use it today!"
"Let's try something different today, let's use your new __ when we're practicing ___!"
"Today I think we should try your ___ when we're practicing ___, let's go get it!"

Parent Interaction Data Collection

Before beginning therapy, offer typical greetings to parents ("Hi ___, how is [participant] doing?", "Hello ___, good to see you", "Hey ___, nice day today", etc.) without initiating any personal conversation topics. Respond to parent conversation interactions by making one statement or question in response related to the parent's statement or question. An exception to this will be if parents discuss topics that therapists are not allowed to discuss, such as other participants, therapist schedules, or other information which may constitute a HIPAA violation. An additional exception will be if parent conversation exceeds 15 minutes, as which point therapists should end the conversation, and continue with therapy. Use a stopwatch to record the length of conversations that occur between you and the participant parent or caregiver. If nontherapeutic conversation does not occur, or if conversation is less than one minute, continue session as normal, and record the length as zero.

At the end of therapy, but before leaving the therapy setting, offer typical farewells to parents ("Bye ___, see you next time", "See you later ___, thanks for your help today", "Bye ___", etc. without instigating any additional conversation. Respond to additional inquires or statements by parents by making one statement or question related to the parent inquiry. Exceptions to this will be similar to those above, except that conversations should be limited to no more than 10 minutes to ensure you are not required to stay past the duration of your scheduled time. Use a stopwatch to record the length of conversations that occur between you and the participant parent or caregiver. If nontherapeutic conversations do not occur, or are less than one minute, record the data as zero and leave the therapy setting. All parent interaction data should also be scored on the specific DTT program data sheet.

Appendix E: Instructions for parents

(Standard Stimuli)

When specifically assigned therapists enter the home or begin telehealth therapy while using standard stimuli, they will be using the same items for therapy that are typically used and no other conditions should differ from therapy which you are typically used to experiencing. You will not need to change anything, or act any differently than you normally would.

(Researcher or Parent Stimuli)

When therapists enter the home or begin telehealth therapy while using stimuli provided by your or the researcher, they will be using different items for one (1) specific participant program, and will take additional data on a new data sheet provided by the researcher. No other conditions will differ from typical therapy, and you will not need to act any differently beyond providing the stimuli to therapists during these sessions, and *only* during these sessions. The only exception to this is the first session in which parent provided stimuli are used, for which you will provide the item to your child before the research team uses it during therapy.

Data collection Procedure (Both Alternate Stimuli Conditions)

During at least 33% of sessions, during *any* condition, therapists may require your assistance for a brief period (up to, but not exceeding 30 minutes) with data collection to make sure we are tracking behavior accurately. The lead researcher will provide you with instructions on how to track behaviors during a behavior simulation. If you have difficulty, the lead therapist will assist you with the point of error using modeling and feedback. Once you are able to record behaviors with 80% accuracy three times, you will be able to take official data with the lead researcher and your team BCBA no more than twice per week.

Appendix F: Rotating Phrases for Researcher/Parent Stimuli DTT sessions

Primary Parent/Researcher Stimuli Session	Subsequent Parent/Researcher Stimuli Sessions
"I have this cool new ___ I brought for us to use during session, and you can keep it when we're done!"	"Let's get our new (item) to practice (DTT target)!"
"Hey ___, I have a surprise for you, we can use it for __ and then it's all yours!"	"Guess what? Today we're going to use your new ___ while we're working!"
"Guess what? I brought you this ___ for when we do ___, and you can keep it later!"	"Hey ___, remember the new ___ you got? Let's go get it so we can use it today!"
"Woah, check out this new ___ I brought for us to use while we're working! After we're done, it'll be yours!"	"We're going to try something different today, let's use your new ___ when we're practicing ___!"
"Hey ___, we have a new present we can use for ___today, and you can keep it when we're done!"	"Today I think we should try your ___ when we're practicing ___, let's go get it!"